

**MEMORANDUM**  
**November 16, 2009**

**TO: SCIENCE PANEL MEMBERS:**

Bruce Duncan, Ph.D., Chair, Science Panel, U.S. EPA Region -10  
Elaine Faustman, Ph.D. University of Washington  
Teri Floyd, Ph.D., Floyd/Snider  
Michael Riley, Ph.D., S.S. Papadopoulos & Associates  
Rosalind Schoof, Ph.D., Integral Consulting, Inc

**FROM: MARTHA HANKINS, DEPARTMENT OF ECOLOGY, TOXICS CLEANUP PROGRAM**  
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**CC:** Dave Bradley, Dawn Hooper, Pete Kmet, Craig McCormack

**SUBJECT: UPCOMING SCIENCE PANEL MEETING**

**DETAILS:**

Meeting Date	November 23, 2009 (Monday)
Time	9am to 3:30 pm, lunch will be provided
Location	UW Botanical Gardens, Isaacson Classroom 3501 NE 41st Street, Seattle, Washington

Enclosed are the agenda and a hefty stack of meeting materials (some of which are included for your reference). Please bring these with you on Monday. The brief overview below is provided to help focus your review of the enclosed materials. We look forward to seeing you.

## **MEETING MATERIALS AND TOPICS**

As part of Ecology's ongoing efforts for updating the MTCA Cleanup Regulation, we have several topics for discussion on November 23. Ecology will briefly review past discussions regarding exposure distributions and probabilistic analysis. The bulk of the meeting will be focused on early-life exposures to carcinogens and vapor intrusion. If time permits, we would like to discuss possible revisions to the air cleanup level equations.

### **Selection of Final Distributions for Exposure Analysis**

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Distributions and Probabilistic Analysis in Support of the Model Toxics Control Act (MTCA) Cleanup Regulation Update; this memorandum details Ecology's responses to the input from the MTCA Science Advisory Board (SAB) regarding exposure distributions used in the probabilistic

analysis.<sup>1</sup> The SAB recommended Ecology re-evaluate the exposure distributions for the following parameters:

- Child and adult body weights
- Child and adult soil ingestion rates
- Soil volatilization factors
- Assumed correlation coefficient of one between body weight and body surface area exposed.

Two appendices provide Ecology's responses to the SAB's recommendations. Ecology believes this information provides a reasonable technical rationale for the selection of the distributions, is responsive to the SAB's comments, and is within a range of technical defensibility for the exposure distributions that have been selected.

## Probabilistic Analysis

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The second part of Distributions and Probabilistic Analysis in Support of the Model Toxics Control Act (MTCA) Cleanup Regulation Update details the results of the probabilistic analysis using the exposure distributions previously described. Information is provided regarding the objectives and goals of the analysis, the exposure distributions, and the methodology employed using the YASAIw simulation tool. Also included are results and regulatory implications. This probabilistic study brings to closure this phase of the analysis.

## Early-Life Exposure

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Intended as an introduction of early-life issue consideration, Ecology presents information regarding the increased susceptibility of children from environmental exposures to carcinogens. Ecology is posing a number of questions related to new scientific information and regulatory guidance being evaluated.

- The U.S. Environmental Protection Agency (EPA) published new guidance, the Guidelines for Carcinogen Risk Assessment, in March 2005. Ecology is evaluating the updated methods for identifying and evaluating carcinogens that are contained in this guidance. Is this guidance consistent with current scientific information?
- EPA published new guidance, Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens, in March 2005. Ecology is evaluating the methods for evaluating child exposure to carcinogens contained in this document. Is this guidance consistent with current scientific information on early-life stage exposure to carcinogens with a mutagenic mode of action?
- The California Environmental Protection Agency (Cal-EPA) has developed methods and policies for making early-life stage adjustments to carcinogens with other modes of action.

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<sup>1</sup> The MTCA Science Advisory Board was dissolved by the 2008 Legislature.

Is this approach consistent with current scientific information on early-life stage exposure to carcinogens with other (non-mutagenic) modes of action?

- What sources of scientific uncertainty and variability should Ecology consider when evaluating these issues and potential changes to the MTCA Cleanup Regulation?

## Vapor Intrusion Guidance

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The Department of Ecology, Toxics Cleanup Program recently released for public comment a Draft Guidance for Evaluating Soil Vapor Intrusion in Washington State: Investigation and Remedial Action. This technical guidance is intended to help responsible parties, environmental professionals, and Ecology site managers assess vapor intrusion at cleanup sites in Washington.

Vapor phase contaminants originating from subsurface sources have the potential to migrate into overlying or nearby buildings. They may contaminate indoor air and adversely affect human health. This technical guidance document provides techniques for evaluating whether vapor intrusion has the potential to contaminate indoor air. On a number of issues a national consensus has yet to emerge. Ecology is particularly interested in feedback on:

- Contaminants of potential concern. The draft guidance includes (Appendix B, page A-8) screening levels designed to provide a reasonably conservative approach for identifying potential vapor intrusion problems. Should additional chemicals be included on the list?
- Use of the Johnson and Ettinger model for estimating indoor air concentrations. Do the draft recommendations (Appendix D, page A-22) seem reasonable? If not, what do you suggest?
- Consideration of background concentrations resulting from indoor and outdoor sources of volatile hazardous substances. Are the recommendations for estimating the indoor air concentrations due to vapor intrusion (section 3.2.3) scientifically defensible? If not, what do you suggest?
- The guidance proposes using a vapor attenuation factor of 1000 for groundwater, a factor of 100 for deep soil gas probes, and a factor of 10 for subslab vapor probes. It also proposes to allow an additional factor of 10 for biodegradation of petroleum hydrocarbons vapors from vapor probes. Are the recommendations in the draft guidance (section 3.1) scientifically defensible? If not, what do you suggest?

## Revisions to Air Cleanup Level Equations

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U.S. EPA no longer recommends oral to inhalation extrapolation because of differences in the toxicokinetics between the oral and inhalation routes of exposure. Furthermore, the inhalation toxicity value developed by U.S. EPA's National Center for Environmental Assessment (NCEA) and currently published on the Integrated Risk Information System (IRIS) uses the metrics consistent with inhalation exposures and applies these inhalation toxicity values directly in the risk-based equations.

- Consistent with U.S. EPA inhalation risk assessment guidance, Ecology is considering discontinuing the assumption that the adverse effects resulting from oral exposures are the same as the effects from inhalation exposures. This means changing the MTCA air cleanup equations to use the inhalation toxicity values directly in the cleanup equations and applying the inhalation toxicity metrics as published in IRIS. Is this approach consistent with current scientific information?

## Enclosures

1. Distributions and Probabilistic Analysis in Support of the Model Toxics Control Act (MTCA) Cleanup Regulation Update
2. Consideration of Early Life Exposure to Chemical Carcinogens
3. *In Utero* and Early Life Susceptibility to Carcinogens: the Derivation of Age-at-Exposure Sensitivity Measures (Cal-EPA)
4. Guidelines for Carcinogen Risk Assessment (EPA)
5. Supplemental Guidance for Assessing Susceptibility from Early Life Exposure to Carcinogens (EPA)
6. CAL-EPA Response to Public Comments with a Focus on Early-Life Exposures and Susceptibility
7. Draft Guidance for Evaluating Soil Vapor Intrusion in Washington State: Investigation and Remedial Action
8. Risk Assessment Guidance for Superfund; Volume I: Human Health Evaluation Manual (Part F, Supplemental Guidance for Inhalation Risk Assessment)